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AMENDMENTS TO THE CLAIMS:

- 1. (Presently Amended) A process for making a thin film ZnO/Cu(InGa)Se₂ solar cell without depositing a buffer layer and by Zn doping from a vapor phase, comprising:
- a) depositing Cu(InGa)Se₂ layer on a metal back contact deposited on a glass substrate;
- b) heating the Cu(InGa)Se₂ layer on said metal back contact on said glass substrate to a temperature range between about 100°C to about 250°C;
- c) subjecting the heated layer of Cu(InGa)Se₂ to an evaporant species from a Zn compound to dope the Cu(InGa) Se₂ with Zn and etching in acetic acid in an amount of about 50% by volume in water to remove ZnO; and
- d) sputter depositing ZnO on the Zn compound evaporant species treated layer of Cu(InGa)Se₂.
- 2. The process of claim 1 wherein said metal back contact is Mo.
- 3. (Presently Amended) The process of claim 2 wherein the zinc compound is selected from the group consisting of zinc acetate dehydrate dihydrate, zinc chloride, zinc iodide, and zinc bromide.
- 4. The process of claim 3 wherein said zinc compound is zinc acetate dihydrate.
- 5. The process of claim 3 wherein in step c) the heated layer of Cu(InGa)Se₂ is subjected to said evaporant species from said Zn compound under a vacuum.
- 6. (Presently Amended) The process of claim 4 wherein the substrate temperature is about 100°C during said heating.
- 7. (Presently Amended) The process of claim 4 wherein the substrate temperature is about 150°C during said heating.
- 8. (Presently Amended) The process of claim 4 wherein the substrate temperature is about 200°C during said heating.
- 9. (Presently Amended) The process of claim 4 wherein the substrate temperature is between 200°C and 250°C during said heating.
- 10. (Cancelled)

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- 11. (Cancelled)
- 12. (Cancelled)
- 13. (Cancelled)
- 14. (Presently Amended) The process of claim 10 6 wherein, prior to sputter depositing ZnO in step d) an annealing step is performed at a temperature range from about 150°C to about 200°C.
- 15. (Presently Amended) The process of claim 11 7 wherein, prior to sputter depositing ZnO in step d) an annealing step is performed at a temperature range from about 150°C to about 200°C.
- 16. (Presently Amended) The process of claim 12 8 wherein, prior to sputter depositing ZnO in step d) an annealing step is performed at a temperature range from about 150°C to about 200°C.
- 17. (Presently Amended) The process of claim 13 9 wherein, prior to sputter depositing ZnO in step d) an annealing step is performed at a temperature range from about 150°C to about 200°C.
- 18. A thin film photovoltaic device comprising a first layer of p-type Cu(InGa)Se₂ semiconductor having an n-type second layer of an evaporant species from a Zn compound that has been etched with acetic acid and sputter deposited with ZnO.
- 19. The thin film photovoltaic device of claim 18 wherein the Zn compound is zinc acetate dihydrate.